may be, while the same force reconciles us to travel through the whirlwind on the ocean some thousands of miles, scarcely aware that there is any danger at all.

To those who are not aware of the facility with which submarine operations are conducted in these days, the work will appear more formidable; thus, by the usual mode of descending in diving-bells, a pipe, communicating with a pump, is required to renew the air; but Dr. Payerne has obviated this inconvenience, having discovered a chemical substance by the decomposition of which he forms air, while another substance absorbs the nitrogen or expirated air, and thus the workmen can remain any length of time below without inconvenience; this would be principally required while boring the bed of the water, for blasting it with gunpowder, as it would be essential to sink the divisions near the shore in the earth, but this operation could be conducted without difficulty. A diver told me more than ten years since, that he had worked for three successive hours in deep water in breaking up a vessel, and ascended above but twice during that time for a few minutes; he said he found himself scarcely more fatigued than if he had worked on land. Since that time considerable improvements have been made in diving-bells, and it is probable that the construction of submarine railways would be the means of suggesting further improvements, which might render the working under water a matter of almost equal facility as on land.

The iron for tunnels should be one inch thick, the plates being made as large as possible, and rivetted together as steam boilers; there should be strong ribs of iron constructed of the shape of the arch, and by placing these sufficiently close, there would be no necessity for having longitudinal ribs, as the plates would bind the whole firmly together, but as an additional security other plates might be rivetted inside; yet this would not probably be required, for if we examine a steam boiler made of iron plates half-an-inch thick, we can hardly conceive what pressure would be able to bend it. So that by using iron one inch thick, we may safely conclude that it would be impossible for it to give way; it would, in fact, be able to bear many a hammering, without receiving injury, for of course it would be infinitely stronger than an arch of brick-work; yet many of these arches have to support much greater weights than iron tunnels could have to sustain, even if a vessel, cargo and all, were to sink on the building; the chances of such an accident must of course be very distant, when we consider the vast extent of the sea, compared with the works of man.

The question which I now submit to the scientific world is,—Can wrought-iron tunnels be used as a medium of railway communication, whether they are suspended between mountains, or placed underground in parks, &c. or imbedded in the water? That many objections may be brought against the plan, I am aware, but objections have been brought against every thing new — objections which have seemed plausible in theory, but which have been found to have no existence in practice. This plan is certainly one of considerable magnitude, and of course a deep consideration is required before coming to any conclusion about it. I may remark that it was not till after having studied the matter in all its bearings, that I ventured to intrude the plan before the public, but I may be mistaken; there is however one circumstance which is perhaps in favour of the plan, it is the fact that several individuals have attempted to claim the invention as their own, and among these several eminent engineers. The name of R. Rettie, C.E. of Glasgow will be familiar with the readers of the THE BUILDER, in connection with attempts to claim the invention. I have been in fact obliged to prove, by the medium of the press, that I was the first who published a plan for constructing iron tunnels, in order to protect myself from the pretensions of many individuals who, whatever they might have projected, evidently required the invention of others,

> "To give to airy nothing
> A local habitation and a *name*.

But however varied may be the opinions on the merits of the plan, I presume that there will be but one opinion as to the advantages which would result if it could be carried out. The door of the continent would be open to the mechanic and the artizan, and the different nations of Europe, instead of viewing one another with a jealous eye, would combine their efforts in civilizing the world, for I believe that it will be universally acknowledged, that the principal cause of war between different nations has been by the one being ignorant of the merits of the other. That this ignorance is already disappearing is evident, so that we may safely infer that ere long, the world will be in a different state to what it was when the highest ambition of man was to destroy his fellow man.

I remain respectfully,

JOHN DE LA HAYE.

London-road, Liverpool, 2nd mo., 7th, 1846.

ROYAL INSTITUTE OF ARCHITECTS.

ON Monday evening, the 23rd inst., Mr. Tite, vice-president, in the chair, Mr. T. C. Penrose, associate, read a paper "On the curved lines of the Parthenon," the result of recent personal examination.

Mr. Penrose gave various dimensions, which shewed that the horizontal lines, namely, those of the steps, architrave, frieze, and cornice, were slightly curved, probably to correct the appearance of depression in the middle which perfectly straight horizontal lines of any length always present to the eye. The writer proved that the sides of the shafts of the columns are also curved, and that the curve is a hyperbola, whose axis is 13·23 feet below the upper step, and focal distance twice 30·5 feet, or 61.

The chairman remarked, that the discovery of the law which regulated the *entasis* of the Greeks was exceedingly valuable. We had all learnt to introduce the entasis in forming columns, but he thought the principle should be carried further—for example, in our porticos and ceilings. The French were more careful in minute matters than we; this resulted in part from the great rapidity with which every thing was done in England. They tried the effect of their sculpture and decorations, by models placed at the height at which they were intended to be fixed; and he advised young architects to adopt the practice. He then urged the importance of adopting the decimal system of weights and measures (which had been alluded to by Mr. Penrose), and promised to bring the matter in a more formal way before the Institute.

Mr. Bellamy could not admit that it was desirable to interfere with the horizontal lines, and contended at some length that we should do wrong by rendering them curvilinear. This opinion was not hastily adopted, but was the result of considerable attention to the subject. The actual rise in the centre of the top step of the Parthenon, 101 feet long, was 2¼ inches; might not this be the effect of disruption.

Mr. Penrose said this might account for it in one building, but did not when we found, as was the case, that the same appeared in the temple of Theseus, and numerous others.

Mr. Scoles laid before the meeting some interesting remarks on the Parthenon, in continuation of the subject, and these we shall probably print entire.

Some sketches of the decorations in the *Sainte Chapelle*, at Paris, were exhibited by Mr. J. G. Crace.

Mr. Poynter, the honorary secretary, then read the minutes of the meeting of council, called to consider the designs and essays which had been submitted in competition for the medals. On "The adaptation and modification of the orders of the Greeks by the Romans and moderns," there were two essays; "On the history and manufacture of bricks," seven; and for the Soane medallion offered for the best design for a royal chapel, "with seats for five hundred persons, inclusive of the suite, attendants, and choir;—the building to be detached, and in a classic Roman, or Italian style;" three sets of drawings had been received. Neither of the essays on the "Orders" were considered by the council sufficiently important to deserve the medal.

Of the seven on bricks, the essay marked,

> "Creditur, ex medio quia res arcessit, habere
> Sudoris minimum,"

was entitled to the medal of the Institute; and a second marked "Do not degrade me by comparing me with the pyramids built of stone, which I excel as much as Jupiter excels the other gods," displayed so much ability, that they proposed presenting to the author a medal of the second order of merit.

On opening the letters accompanying the essays, the first was found to be by Mr. Thomas Worthington, of Manchester, and the second by Mr. S. J. Nichol, of 11, Argyll-place, London.

The designs, although they all displayed considerable ability, were not of that high class that the Institute had a right to expect for the Soane medallion: they selected the set marked "Pendent opera interrupta," as the best, and awarded to it a medal of the second order. The name of the author was found to be J. T. Wadmore, Upper Clapton.

It is to be regretted that a want of attention to construction was observable, as well in the selected set as in the others.

Several varieties of improved window-sashes were exhibited by the inventors, amongst them a frame and sashes made by Johnson and Pask, to exemplify Herring's method of hanging sashes, whereby they may be instantly disconnected from the frame without removing the beading. It is exceedingly simple, increases the cost but slightly, and appears to answer the purpose well.

CEMENT FOR CURING DAMP WALLS, KITCHEN FLOORS, &c.

SIR,—As a subscriber to your valuable journal from the commencement, will you oblige me by inserting the following valuable and effectual receipt for curing damp walls, and suitable for use in flooring kitchens, and other purposes where the prevention of wet is necessary. The composition has been successfully used by many persons. Boil two quarts of tar with two ounces of kitchen grease for a quarter of an hour in an iron pot; add some of this tar to a mixture of slaked lime and powdered glass which have passed through a flour sieve, and been dried completely over the fire in an iron pot, in the proportion of two parts of lime and one of glass, till the mixture becomes of the consistence of thin plaster. This cement must be used immediately after being mixed. It is not well to mix more at a time than will coat one square foot of wall, as it quickly becomes too hard for use, and continues to increase its hardness for three weeks. Great care must be taken to prevent any moisture from mixing with the cement.

For a wall which is merely damp, it will be sufficient to lay on one coating of the cement, about one-eighth of an inch thick; but should the wall be more than damp, or wet, it will be necessary to coat it a second time. Plaster made of lime, hair, and plaster of Paris, may be afterwards laid on the cement. This cement, when put in water, will suffer neither an increase nor diminution in its weight.

Should the inquirer, W. H. O., feel inclined to try this receipt, I have not the least hesitation in saying he will find it answer his purpose.

Hoping the above will prove advantageous to some readers of your most useful and widely-circulated journal, I beg to subscribe myself,

JOHN HORSMAN, jun., mason.

Pontypool, Monmouthshire.

ACCIDENTS THROUGH THE BREAKING OF CHAINS.—Two accidents have lately occurred while lifting heavy masses of stone, through the insufficiency of the chains employed. The first took place at Mr. Jackson's at Pimlico, about three weeks since, when one of the workmen was so seriously injured, that for several days his life was despaired of. The other occurred last week at the British Museum while raising a block, weighing nearly eight tons; in its fall, it crushed the hand of a mason named Keller, and nearly caused the death of three others. Both prudence and humanity alike suggest that an occasional inspection and test of chains used in lifting such enormous weights, should take place.

NEW CRIMINAL COURT ADJOINING NEWGATE.—The city authorities have determined upon erecting a third Criminal Court in the Old Bailey. Last week, at a Court of Aldermen, the subject was referred to the committee of general purposes to be carried into effect.

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